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EXAMINER	
FOX, BRYAN J	

ART UNIT	PAPER NUMBER
2686	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/998,964	ARIGA ET AL.	
	Examiner	Art Unit	
	Bryan J Fox	2686	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *7,8,10 and 11* is/are allowed.

6)☒ Claim(s) *1-5,9,12-15,19 and 20* is/are rejected.

7)☒ Claim(s) *6 and 16-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2 and 4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Garcia-Luna-Aceves et al (US 20030037167A1).

Regarding claim 1, Garcia-Luna-Aceves et al discloses an ad-hoc network 10, which reads on the claimed "network system", including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device" and hosts 22A-22C (see page 4, paragraph 43 and figure 1), which read on the claimed "terminal communicating with said center via said relay station device". Internet Radios 16a and 16b may act as "AirHeads", communicating with a router to the Internet, which reads on the claimed "said relay station device has a first function for directly communicating with said center", while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "second function for communicating with said center via another relay station".

Regarding claim 12, Garcia-Luna-Aceves et al discloses an ad-hoc network 10 including a number of Internet Radios 16a-16 (see page 4, paragraph 42 and figure 1), which read on the claimed "relay station device" and hosts 22A-22C (see page 4, paragraph 43 and figure 1), which read on the claimed "terminal". The hosts access the Internet through the network 10 (see page 4, paragraph 43 and figure 1), which reads on the claimed "relay unit relaying communication between a center and a terminal". The Internet Radios 16a and 16b may act as "AirHeads", communicating with a router to the Internet, which reads on the claimed "said relay station device has a first executing unit executing a first function for directly communicating with said center", while Internet Radios 16c-16i communicate with the router to the Internet via the "AirHeads" 16a and 16b (see page 4, paragraphs 42 and 43 and figure 1), which reads on the claimed "second executing unit executing a second function for communicating with said center via another relay station".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 2, 3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al in view of Sausta et al (US5034993).

Regarding claims 2 and 13, Garcia-Luna-Aceves et al fails to teach switching modes of operation in response to communication quantity.

Sausta et al discloses a system that allocates reserve resources based on the load in two systems. When one system is using all its resources, a repeater is assigned to that system (see column 3, lines 15-21). The permanently allocated resources in that system read on the claimed "threshold".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Sausta et al to include the above dynamic allocation of resources in order to maximize the efficiency of the overall system and decrease the need for added hardware.

Regarding claim 3, the combination of Garcia-Luna-Aceves et al and Sausta et al discloses that a resource manager 305 allocates or de-allocates resources based upon loading information (see Sausta et al column 3, lines 57-62).

5. Claims 4, 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al in view of Ramanathan (US005850592A).

Regarding claims 4 and 14, Garcia-Luna-Aceves et al fails to expressly disclose switching operating modes in response to not being able to communicate in one mode.

Ramanathan discloses a communication network employing a plurality of similar mobile stations, some of which are operating as cluster gateways and some of which are operating as non-gateway, or cluster member stations (see column 3, lines 1-13 and figure 1). The cluster gateway mode of operation reads on the claimed "first operating mode for executing said first function" and the non-gateway or cluster member mode reads on the claimed "second operating mode for executing said second function". A station first attempts to affiliate with an existing cluster gateway station, and, if successful, operates as a cluster member (see column 3, lines 41-50 and figure 2). However, if the station cannot connect to an existing cluster gateway station, the station enters operation as a cluster gateway (see column 4, lines 8-19 and figure 2), which reads on the claimed "said relay station device cannot communicate with a host station including said another relay station, said relay station device is set to said first operating mode".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al to include the above mode switching as disclosed by Ramanathan in order to provide a network which posses the ability to adaptively reorganize in the face of movement or destruction and that is highly reliable and simple and inexpensive to construct as suggested by Ramanathan (see column 1, lines 50-56).

Regarding claim 5, the combination of Garcia-Luna-Aceves et al and Ramanathan discloses that periodically, each gateway station tests its proximity conditions to other gateway stations and if the test indicates that the particular station's

operation as a gateway is redundant or unnecessary, the station resigns and commences operation as a cluster member rather than as a cluster gateway as previously (see Ramanathan column 4, lines 30-46).

6. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al in view of Totaro et al (US006137885A).

Regarding claims 9 and 19, Garcia-Luna-Aceves discloses that internet radios 16a and 16b are connected to the Internet via LAN 20 (see figure 1), which reads on the claimed "mobile communication network line is used for communication between said another relay station and said center". Garcia-Luna-Aceves fails to disclose direct communication between terminals.

Totaro et al discloses a system that allows a direct encrypted radio telephone link between two terminals of a mobile radio network (see column 2, lines 66-67 and figure 1) where the direct radio link is facilitated by the terminal (see column 3, lines 14-43 and figure 3), which reads on the claimed "communication between said relay station device and said terminal is made through direct communication between terminals".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Garcia-Luna-Aceves et al with Totaro et al to include the above direct link between terminals in order to conserve system resources.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al in view of Sausta et al as applied to claim 13 above, and further in view of Ramanathan.

Regarding claim 15, the combination of Garcia-Luna-Aceves et al and Sausta et al fails to expressly disclose switching operating modes in response to not being able to communicate in one mode.

Ramanathan discloses a communication network employing a plurality of similar mobile stations, some of which are operating as cluster gateways and some of which are operating as non-gateway, or cluster member stations (see column 3, lines 1-13 and figure 1). The cluster gateway mode of operation reads on the claimed "first operating mode" and the non-gateway or cluster member mode reads on the claimed "second operating mode". A station first attempts to affiliate with an existing cluster gateway station, and, if successful, operates as a cluster member (see column 3, lines 41-50 and figure 2). However, if the station cannot connect to an existing cluster gateway station, the station enters operation as a cluster gateway (see column 4, lines 8-19 and figure 2), which reads on the claimed "said relay station device cannot communicate with a host station including said another relay station, said relay station device is set to said first operating mode".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Garcia-Luna-Aceves et al and Sausta et al to include the above mode switching as disclosed by Ramanathan in order to provide a network which posses the ability to adaptively reorganize in the face of movement or destruction and that is highly reliable and simple and inexpensive to construct as suggested by Ramanathan (see column 1, lines 50-56).

8. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al in view of Sausta et al as applied to claim 13 above, and further in view of Totaro et al.

Regarding claim 20, the combination of Garcia-Luna-Aceves et al and Sausta et al discloses that internet radios 16a and 16b are connected to the Internet via LAN 20 (see Garcia-Luna-Aceves et al figure 1), which reads on the claimed "mobile communication network line is used for communication between said another relay station and said center". The combination of Garcia-Luna-Aceves et al and Sausta et al fails to disclose direct communication between terminals.

Totaro et al discloses a system that allows a direct encrypted radio telephone link between two terminals of a mobile radio network (see column 2, lines 66-67 and figure 1) where the direct radio link is facilitated by the terminal (see column 3, lines 14-43 and figure 3), which reads on the claimed "communication between said relay station device and said terminal is made through direct communication between terminals".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Garcia-Luna-Aceves et al and Sausta et al with Totaro et al to include the above direct link between terminals in order to conserve system resources.

Allowable Subject Matter

9. Claims 6 and 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, the prior art applied fails to teach or render obvious the network system according to claim 4, wherein when said relay station device cannot communicate with said host station including said another relay station, said relay station device outputs a communication stop signal indicating said host station to said center, and wherein when said host station can communicate with said relay station device, said host station outputs to said center a recovery declaration signal indicating that said host station can communicate with said relay station device, and wherein said center outputs to said relay station device a recovery notification signal indicating that said host station is communicable based on said communication stop signal and said recovery declaration signal, and wherein said relay station device is switched from said first operating mode to said second operating mode in response to said recovery notification signal.

Regarding claim 16, the prior art applied fails to teach or render obvious the relay station device according to claim 12, wherein said relay station device is set to one of a first operating mode for executing said first function and a second operating mode for executing said second function, and wherein said relay station device is set to one of said first operating mode and said second operating mode in response to a message indicating mode switching received from a slave station including said terminal.

Regarding claim 17, the prior art applied fails to teach or render obvious the relay station device according to claim 13, wherein said relay station device is set to one of a

first operating mode for executing said first function and a second operating mode for executing said second function, and wherein said relay station device is set to one of said first operating mode and said second operating mode in response to a message indicating mode switching received from a slave station including said terminal.

Regarding claim 18, the prior art applied fails to teach or render obvious the relay station device according to claim 14, wherein said relay station device is set to one of a first operating mode for executing said first function and a second operating mode for executing said second function, and wherein said relay station device is set to one of said first operating mode and said second operating mode in response to a message indicating mode switching received from a slave station including said terminal.

11. Claims 7, 8, 10 and 11 are allowed.

12. The following is an examiner's statement of reasons for allowance:

Regarding claim 7, the prior art applied fails to teach or render obvious a network system, comprising: a center; a first relay station device; a second relay station device provided between said center and said first relay station device; and a terminal communicating with said center via said first and second relay station devices, and wherein said first relay station device has a first function for directly communicating with said center and a second function for communicating with said center via said second relay station device and another relay station, *and wherein said second relay station device transmits to said first relay station device a communication quantity data indicating a communication quantity in said second relay station device, and wherein said first relay station device is set to one of a first operating mode for executing said*

first function and a second operating mode for executing said second function based on said communication quantity data.

Regarding claim 8, the prior art applied fails to teach or render obvious a network system, comprising: a center; a relay station device; and a terminal communicating with said center via said relay station device, and wherein said relay station device has a first function for directly communicating with said center and a second function for communicating with said center via another relay station, *and wherein one of a first operating mode for executing said first function and a second operating mode for executing said second function is set to said relay station device in response to a message indicating mode switching transmitted from a slave station including said terminal.*

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Koponen et al (US005551056A) discloses a method for securing the operation of a telecommunications network in a cellular radio system and a base station arrangement.

Bandeira et al (US 20020072329A1) discloses a scalable wireless network topology systems and methods.

Sherman et al (US005455569A) discloses a link layered communications network and method.

La Fratta et al (US006169880B1) discloses a method and system of lead sharing and prioritization of radio repeaters.

Sherman (US005974236A) discloses dynamically reconfigurable communications network and method.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan J Fox whose telephone number is (703) 305-8994. The examiner can normally be reached on Monday through Friday 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

6-14-04

NGUYEN T. VO
PRIMARY EXAMINER